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Hard-surface cleaning compositions.

57 Liquid hard-surface cleaning compositions are disclosed which have a viscosity above 30 cps, show excellent cleaning on both kitchen and bathroom soils, and excellent shine performance.

These compositions are substantially free of hydrotropes, and contain a narrowly-defined binary solvent system constituted of Butyl Carbitol on one hand and Butoxy Propoxy Propanol or hexyl Carbitol on the other hand.

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HARD-SURFACE CLEANING COMPOSITIONS

Technical Field

The present invention relates to liquid hard-surface cleaning compositions which have a viscosity above 30 cps, show excellent cleaning on both kitchen and bathroom soils, and excellent shine performance.

These compositions are substantially free of hydrotropes, and contain a narrowly-defined binary solvent system constituted of Butyl Carbitol on one hand and Butoxy Propoxy Propanol or hexyl Carbitol on the other hand.

Background

It is well-known to formulate hard-surface cleaning compositions containing solvents.

In particular, compositions containing a binary solvent system constituted of terpenes and polar solvents such as benzyl alcohol and butyl carbitol have been disclosed in European Patents 0 040 882 and 0 080 749.

There is a need for hard-surface cleaners containing organic solvents, which are substantially free of hydrotropes, since hydrotropes such as cumene sulfonate can be detrimental to performance, especially shine.

There is also a need for liquid hard-surface cleaners which are more viscous than current similar products, i.e. which have a viscosity above 30 cps. Indeed, a product with such a viscosity, will show a better pouring control, will avoid product loss by penetration into e.g. the sponge used to apply it on the surface, and will be more efficient for use on inclined surfaces. Viscous products can be formulated using thickening agents typically used in commercial products. The rheology of such compositions is generally less desirable than that of the current invention. Thickening agents can also be detrimental to product performance.

It has now been found that liquid hard-surface cleaning compositions can be formulated, which are substantially free of hydrotrope, are substantially viscous and show remarkable cleaning efficiency on both kitchen and bathroom soils, and shine performance, such compositions contain a specific binary solvent system.

EP-A 0 165 885 discloses concentrated liquid hard-surface cleaning compositions containing a ternary active system having hydrotroping properties. US-3,591,510 relates to the use of propylene-glycol derivatives in dilute liquid hard-surface cleansers.

It is an object of the present invention to provide a liquid hard-surface cleaner composition with excellent cleaning on kitchen and bathroom soils and very good shine performance.

It is another object of the present invention to provide a liquid hard-surface cleaner which has a viscosity above 30 cps.

Summary of the Invention

- The present invention relates to a liquid hard-surface cleaning composition containing
 - from 3% to 10% of surface-active agent
 - from 3% to 10% of a binary solvent mixture consisting of Butyl Carbitol on one hand, and n-Butoxy Propoxy Propanol or hexyl carbitol on the other hand, in a weight ratio of 4/1 to 1/4;
 - from 1% to 10% of a builder and from 0.5% to 8% of a buffer, at a ratio of buffer to builder from 3/1 to 1/3
- 50 less than 1.5% of hydrotrope.

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Detailed Description of the Invention

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The surface-active agents, the solvent and the optional ingredients are described in more detail hereinafter.

Unless indicated to the contrary, the %-indications stand for "% by weight".

Surface-active Agents

Water-soluble detersive surfactants useful herein include well-known synthetic anionic, nonionic, amphoteric and zwitterionic surfactants and mixtures thereof. Typical of these are the alkyl benzene sulfates and sulfonates, paraffin sulfonates, olefin sulfonates, alkoxylated (especially ethoxylated) alcohols and alkyl phenols, amine oxides, sulfonates of fatty acids and of fatty acid esters, and the like, which are well-known in the detergency art. In general, such detersive surfactants contain an alkyl group in the C₁₀-C₁₈ range; the anionic detersive surfactants are most commonly used in the form of their sodium, potassium or triethanolammonium salts. The nonionics generally contain from 3 to 17 ethylene oxide groups per mole of hydrophobic moeity. Especially preferred in the compositions of the present invention are: C₁₂-C₁₆ alkyl benzene sulfonates, C₁₂-C₁₈ paraffin-sulfonates and the ethoxylated alcohols of the formula RO(CH₂CH₂O)-nH, with R being a C₁₂-C₁₅ alkyl chain and n being a number from 3 to 10.

Anionic surfactants are frequently present at levels from 3 to 8% of the composition. Nonionic surfactants if used, are typically used at levels between 1% to 5% by weight of the composition. Mixtures of the like surfactants can also be used. The total level of surface-active agents in the present concentrated compositions is from 3% to 10% by weight of the total composition.

25 The organic solvent

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The organic solvent for use herein is constituted by a very specific binary system of a water-soluble solvent and a solvent of low water-solubility.

The water-soluble solvent is Butyl Carbitol i.e. 2-(2-butoxyethoxy)ethanol, and the water-insoluble solvent is selected from the group of n-Butoxy Propoxy Propanol, i.e. 1(2-n-butoxy-1-methylethoxy) propane-2-ol, and hexyl carbitol, i.e. 2-(2-hexoxyethoxy)ethanol. n-Butoxy Propoxy Propanol is the preferred solvent of low water-solubility.

The weight ratio of Butyl Carbitol to n-Butoxy Propoxy Propanol or Hexyl Carbitol is in the range from 4/1 to 1/4, preferably from 4/1 to 1/1.

The total level of solvent is in the range from 3% to 10% of the total composition, preferably 4% to 8%.

Builder/Buffer system

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Also critical in the context of the present invention is the Builder/Buffer system.

The Builder should be present at levels of from 1% to 10% preferably 1% to 5% by weight of the total composition.

Compounds classifiable and well-known in the art as detergent builders include the nitrilotriacetates, (NTA), polycarboxylates, citrates, water-soluble phosphates such as tri-polyphosphate and sodium orthoand pyro-phosphates, silicates, ethylene diamine tetraacetate (EDTA), amino-polyphosphonates (DEQUEST), phosphates and mixtures thereof. Preferred builder for use in the present invention is sodium citrate.

The Buffer is used to adjust and buffer the pH to a 8-11 range, preferably about 10-10.8. It is represented by alkali metal carbonates, preferably sodium carbonate; and present at levels of from 0.5% to 8%, preferably from 1% to 3% of the total composition, the ratio between buffer and builder should be in the range from 3/1 to 1/3, preferably 3/1 to 1/1.

Product viscosity

The viscosity of the present compositions is above 30 cps, preferably in the range from 30 to 110 cps, which is substantially higher than current liquid compositions, 3 to 5 cps.

These figures apply to viscosity as measured in a Brookfield LVDT viscometer, with Spindle N 2, at

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60 rpm (low shear).

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Optional components are represented by ingredients typically used in commercial products to provide aesthetic or additional product performance benefits. Typical ingredients include pH regulants, perfumes, dyes, optical brighteners, soil suspending agents, detersive enzymes, gel-control agents, freeze-thaw stabilizers, bactericides, preservatives, and the like.

There is no need for a thickener in the present compositions.

The following compositions are prepared:

Hydrotrope can be present, however at levels not exceeding 1.5%. Examples of suitable hydrotropes are urea, monoethanolamine, diethanolamine, triethanolamine and the sodium potassium, ammonium and alkanol ammonium salts of xylene-, toluene-, ethylbenzene- and isopropyl-benzene sulfonates.

The compositions herein typically contain water as a carrier. By way of example the water-level can vary in the range from e.g. 40% to 60%. Water-alcohol (e.g., ethanol, isopropanol, butanol, etc.) mixtures can also be used. Alkylated polysaccharides can be used to increase the stability and performance characteristics of the compositions.

The following examples are given by way of illustrating the compositions herein, but are not intended to be limiting of the scope of the invention.

	Abreviations
LAS NaPS NTA n-BPP	Sodium Salt of Linear C ₁₁₋₁₈ Alkyl Benzene Sulfonate Sodium C ₁₃ -C ₁₅ paraffin sulfonate Sodium nitrilotriacetate n- Butoxy Propoxy Propanol

Ingredient	percentage by weight						
LAS	5	5	4	4	5	_	
NaPS	-	-	2	1	-	-	
Lauryl alcohol sulphate	-	-	-	-	•	5	
Sodium Carbonate	3	3	3	2	4	3	
Sodium Citrate	1	-3	1	- .	2	1	
NTA	•	-	-	2	•	-	
Butyl Carbitol	4	4	4	3	3	4	
n-BPP	2	2	-	3	3	2	
Hexyl Carbitol	•	_	2	-	•	-	
Perfume	0.5	1.0	1.0	0.5	0.5	0.5	

The above compositions were found to show very good cleaning performance on both kitchen and bathroom soils, and excellent shine performance.

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up to 100

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110

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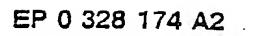
Claims

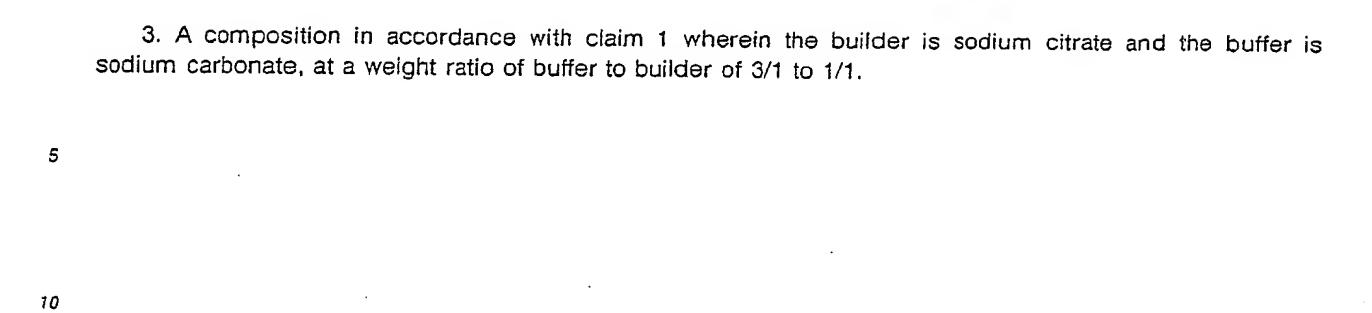
- 1. A liquid hard-surface cleaning composition containing
- from 3% to 10% of surface-active agent

Dyes, miscellaneous, water

Product viscosity (cps)

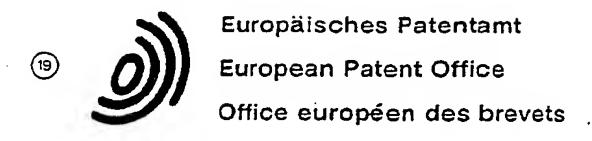
- from 3% to 10% of a binary solvent mixture consisting of Butyl Carbitol on one hand, and n-Butoxy Propoxy Propanol or hexyl carbitol on the other hand, in a weight ratio of 4/1 to 1/4.
- at from 1% to 10% of a builder and from 0.5% to 8% of a buffer, at a ratio of buffer to builder of from 3/1 to 1/3 55
 - less than 1.5% of hydrotrope.
 - 2. A composition in accordance with claim 1, wherein the binary solvent mixture consists in a mixture of Butyl Carbitol and n-Butoxy Propoxy Butanol, in a weight ratio of 4/1 to 1/1.





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(2) **EUROPEAN PATENT APPLICATION**

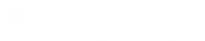
21) Application number: 89200144.7

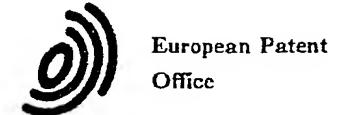
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- 71 Applicant: THE PROCTER & GAMBLE COMPANY One Procter & Gamble Plaza Cincinnati Ohio 45202(US)
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- (24) Representative: Canonici, Jean-Jacques et al Procter & Gamble European Technical Center N.V. Temselaan 100 B-1820 Strombeek-Bever(BE)
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EUROPEAN SEARCH REPORT

EP 89 20 0144

Application Number

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
P,X	EP-A-O 273 472 (THE PROCTER & GAMBLE CO.) * page 2, lines 44-49; page 3, lines 28-37; page 4, lines 1-7, 17-22; claims 1-5 *	1	C 11 D 3/43 C 11 D 3/20 C 11 D 3/16 C 11 D 17/00
Α		2,3	C 11 D 3/44
A	EP-A-O 105 063 (THE PROCTER & GAMBLE CO.) * claims *	1-3	
A,D	US-A-3 591 510 (W.E. ZENK) * claims *	1-3	
	EP-A-0 261 874 (THE PROCTER & GAMBLE CO.) * claims *	1-3	•
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			C 11 D
		,	
	The present search report has been drawn up for all claims		
	Place of search Date of completion of the search	, , , ,	Examiner T 1/4 D 1 A T D
BE	RLIN 15-02-1990	PELL	I-WABLAT B
X : parti Y : parti docu A : techt	cularly relevant if taken alone after the filing cularly relevant if combined with another actually relevant if combined with another after the filing cularly relevant if combined with another actually document city and actually	nciple underlying the document, but publicate led in the application led for other reasons	shed on, or

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